

01-19-06

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Dated: January 17, 2006

Signature:

*Mary Jane D'Alma*  
(Mary Jane D'Alma)

Docket No.: ASZD-P01-897  
(PATENT)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of:  
McKerrecher et al.

Application No.: 10/534650

Confirmation No.: 6547

Filed: May 12, 2005

Art Unit: 1615

For: BENZOFURAN DERIVATIVES, PROCESS  
FOR THEIR PREPARATION AND  
INTERMEDIATES THEREOF

Examiner: Not Yet Assigned

**INFORMATION DISCLOSURE STATEMENT (IDS)**

MS Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

Pursuant to 37 CFR 1.56, 1.97 and 1.98, the attention of the Patent and Trademark Office is hereby directed to the references listed on the attached PTO/SB/08. It is respectfully requested that the information be expressly considered during the prosecution of this application, and that the references be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

This Information Disclosure Statement is filed before the mailing date of a first Office Action on the merits as far as is known to the undersigned (37 CFR 1.97(b)(3)).

A summary/abstract translation of the non-English language references is enclosed.

Applicant has not submitted copies of each cited U.S. patent and U.S. patent application as required by 37 CFR 1.98(a)(2)(i), amended October 2004, as the U.S. Patent and Trademark Office has waived this requirement for all U.S. patent applications. Applicant submits herewith copies of foreign and non-patents in accordance with 37 CFR 1.98(a)(2).

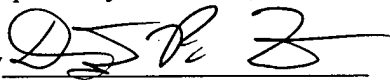
In accordance with 37 CFR 1.97(g), the filing of this Information Disclosure Statement shall not be construed to mean that a search has been made or that no other material information as defined in 37 CFR 1.56(a) exists. In accordance with 37 CFR 1.97(h), the filing of this Information Disclosure statement shall not be construed to be an admission that any patent, publication or other information referred to therein is "prior art" for this invention unless specifically designated as such.

It is submitted that the Information Disclosure Statement is in compliance with 37 CFR 1.98 and the Examiner is respectfully requested to consider the listed references.

The Director is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 18-1945, under Order No. ASZD-P01-897.

Dated: January 17, 2006

Respectfully submitted,

By 

David P. Halstead, Ph.D.

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PTO/SB/08a/b (07-05)

Approved for use through 07/31/2006. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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|   |   |    | Application Number       | 10/534650              |              |
|   |   |    | Filing Date              | May 12, 2005           |              |
|   |   |    | First Named Inventor     | Darren McKerrecher     |              |
|   |   |    | Art Unit                 | 1615                   |              |
|   |   |    | Examiner Name            | Not Yet Assigned       |              |
| Sheet   | 1 | of | 3                        | Attorney Docket Number | ASZD-P01-897 |

| U.S. PATENT DOCUMENTS |                       |   |                                |  |   |
|-----------------------|-----------------------|---|--------------------------------|--|---|
| Examiner Initials*    | Cite No. <sup>1</sup> | Document Number<br>Number-Kind Code <sup>2</sup> (if known) | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Pages, Columns, Lines, Where<br>Relevant Passages or Relevant<br>Figures Appear |
|                       |                       |   |                                |  |   |

| FOREIGN PATENT DOCUMENTS |                       |   |                                |   |   |   |
|--------------------------|-----------------------|---|--------------------------------|---|---|---|
| Examiner Initials*       | Cite No. <sup>1</sup> | Foreign Patent Document   | Publication Date<br>MM-DD-YYYY | Name of Patentee or Applicant of Cited Document | Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear | T |
|                          |                       | Country Code <sup>3</sup> -Number <sup>4</sup> -Kind Code <sup>5</sup> (if known) |                                |   |   |   |
|                          | BA                    | WO-00/58293-A1  | 10-05-2000                     | F. Hoffmann-La Roche AG                         |   |   |
|                          | BB                    | WO-01/20327-A1  | 03-22-2001                     | AstraZeneca AB                                  |   |   |
|                          | BC                    | WO-01/44216-A1  | 06-21-2001                     | F. Hoffman-La Roche AG                          |   |   |
|                          | BD                    | WO-01/83465-A2  | 11-08-2001                     | F. Hoffman-La Roche AG                          |   |   |
|                          | BE                    | WO-01/83478-A2  | 11-08-2001                     | F. Hoffman-La Roche AG                          |   |   |
|                          | BF                    | WO-01/85706-A1  | 11-15-2001                     | F. Hoffman-La Roche AG                          |   |   |
|                          | BG                    | WO-01/85707-A1  | 11-15-2001                     | F. Hoffman-La Roche AG                          |   |   |
|                          | BH                    | WO-02/08209-A1  | 01-31-2002                     | F. Hoffman-La Roche AG                          |   |   |
|                          | BI                    | WO-02/14312-A1  | 02-21-2002                     | F. Hoffman-La Roche AG                          |   |   |
|                          | BJ                    | WO-02/46173-A1  | 06-13-2002                     | F. Hoffman-La Roche AG                          |   |   |
|                          | BK                    | WO-02/48106-A2  | 06-20-2002                     | F. Hoffman-La Roche AG                          |   |   |
|                          | BL                    | WO-03/000262-A1   | 01-03-2003                     | AstraZeneca AB                                  |   |   |
|                          | BM                    | WO-03/000267-A1   | 01-03-2003                     | AstraZeneca AB                                  |   |   |
|                          | BN                    | WO-03/015774-A1   | 02-27-2003                     | AstraZeneca AB                                  |   |   |
|                          | BO                    | WO-03/022856-A1   | 03-20-2003                     | Pharmacia & Upjohn Company                      |   |   |
|                          | BP                    | WO-03/047626-A1   | 06-12-2003                     | Novo Nordisk A/S                                |   |   |
|                          | BQ                    | WO-03/055482-A1   | 07-10-2003                     | Novo Nordisk A/S                                |   |   |
|                          | BR                    | WO-03/080585-A1   | 10-02-2003                     | Banyu Pharmaceutical Co., Ltd.                  |   |   |
|                          | BS                    | WO-03/095438-A1   | 11-20-2003                     | F. Hoffman-La Roche AG                          |   |   |
|                          | BT                    | WO-03/097824-A1   | 11-27-2003                     | Banyu Pharmaceutical Co., Ltd.                  |   |   |
|                          | BU                    | WO-04/002481-A1   | 01-08-2004                     | Novo Nordisk A/S                                |   |   |
|                          | BV                    | WO-04/045614-A1   | 06-03-2004                     | AstraZeneca AB                                  |   |   |
|                          | BW                    | WO-04/046139-A1   | 06-03-2004                     | AstraZeneca AB                                  |   |   |
|                          | BX                    | WO-04/050645-A1   | 06-17-2004                     | Novartis AG                                     |   |   |
|                          | BY                    | WO-04/052869-A1   | 06-24-2004                     | F. Hoffman-La Roche AG                          |   |   |
|                          | BZ                    | WO-04/063179-A1   | 07-29-2004                     | Eli Lilly and Company                           |   |   |
|                          | BA1                   | WO-04/063194-A1   | 07-29-2004                     | Eli Lilly and Company                           |   |   |
|                          | BB1                   | WO-04/072031-A2   | 08-26-2004                     | Osi Pharmaceuticals, Inc.                       |   |   |
|                          | BC1                   | WO-04/072066-A1   | 08-26-2004                     | Osi Pharmaceuticals, Inc.                       |   |   |
|                          | BD1                   | WO-04/076420-A1   | 09-10-2004                     | Banyu Pharmaceutical Co., Ltd.                  |   |   |
|                          | BE1                   | WO-04/081001-A1   | 09-23-2004                     | Banyu Pharmaceutical Co., Ltd.                  |   |   |
|                          | BF1                   | WO-05/044801-A1   | 05-19-2005                     | AstraZeneca AB                                  |   |   |
|                          | BG1                   | WO-05/049019-A1   | 06-02-2005                     | Novo Nordisk A/S                                |   |   |
|                          | BH1                   | WO-05/054200-A1   | 06-16-2005                     | AstraZeneca AB                                  |   |   |
|                          | BI1                   | WO-05/054233-A1   | 06-16-2005                     | AstraZeneca AB                                  |   |   |
|                          | BJ1                   | WO-05/056530-A1   | 06-23-2005                     | AstraZeneca AB                                  |   |   |

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| Examiner Signature |  | Date Considered |  |
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|   |   |    |   | Filing Date              | May 12, 2005       |
|   |   |    |   | First Named Inventor     | Darren McKerrecher |
|   |   |    |   | Art Unit                 | 1615               |
|   |   |    |   | Examiner Name            | Not Yet Assigned   |
| Sheet   | 2 | of | 3 | Attorney Docket Number   | ASZD-P01-897       |

|  |     |               |            |                        |  |  |
|--|-----|---------------|------------|------------------------|--|--|
|  | BK1 | EP-1336607-A1 | 08-20-2003 | Novo Nordisk A/S       |  |  |
|  | BL1 | GB-2385328-A  | 08-20-2003 | F. Hoffman-La Roche AG |  |  |

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| NON PATENT LITERATURE DOCUMENTS |                       |   |                |  |
|---------------------------------|-----------------------|---|----------------|--|
| Examiner Initials               | Cite No. <sup>1</sup> | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.   | T <sup>2</sup> |  |
|                                 | CA                    | Alvarez et al., "Expression of the Glucagon-Like Peptide-1 Receptor Gene in Rat Brain," Journal of Neurochemistry 66(3):920-927 (1996)  |                |  |
|                                 | CB                    | Alvarez et al., "Evidence that Glucokinase Regulatory Protein is Expressed and Interacts with Glucokinase in Rat Brain," Journal of Neurochemistry 80:45-53 (2002)  |                |  |
|                                 | CC                    | Bell et al., "Glucokinase Mutations, Insulin Secretion, and Diabetes Mellitus," Annu. Rev. Physiol. 58:171-186 (1996)   |                |  |
|                                 | CD                    | Brocklehurst et al., "Stimulation of Hepatocyte Glucose Metabolism by Novel Small Molecule Glucokinase Activators," Diabetes 53:535-541 (2004)  |                |  |
|                                 | CE                    | Caro et al., "Liver Glucokinase: Decreased Activity in Patients with Type II Diabetes," Horm. Metab. Res. 27:19-22 (1995)   |                |  |
|                                 | CF                    | Christesen et al., "The Second Activating Glucokinase Mutation (A456V) Implications for Glucose Homeostasis and Diabetes Therapy," Diabetes 51:1240-1246 (2002)   |                |  |
|                                 | CG                    | Corbett, "Track 3 - Mastering Medicinal Chemistry: Applying Organic Chemistry to Biological Problems, Success Stories in Medicinal Chemistry," Molecular Medicine Tri-Conference, Moscone West Convention Center, San Francisco California, 3/26/05 - 11:00-11:30<br>Glucokinase Activators: Discovery of Novel, Orally Active Glucose Lowering Agents, March 24-26, 2004 |                |  |
|                                 | CH                    | DeFronzo, "The Triumvirate: $\beta$ -Cell, Muscle, Liver - A Collusion Responsible for NIDDM," Diabetes 37:667-687 (1988)   |                |  |
|                                 | CI                    | Desai et al., "Phenotypic correction of Diabetic Mice by Adenovirus-Mediated Glucokinase Expression," Diabetes 50:2287-2295 (2001)  |                |  |
|                                 | CJ                    | Ferre et al., "Correction of Diabetic Alterations by Glucokinase," Proc. Natl. Acad. Sci. USA 93:7225-7230 (1996)   |                |  |
|                                 | CK                    | Froguel et al., "Familial Hyperglycemia Due to Mutations in Glucokinase - Definition of a Subtype of Diabetes Mellitus," The New England Journal of Medicine 328(10):697-702 (1993)   |                |  |
|                                 | CL                    | Fujimoto et al., "Administration of D-Glucosamine into the Third Cerebroventricle Induced Feeding Accompanied by Hyperglycemia in Rats," Life Sciences 37(26):2475-2482 (1985)  |                |  |
|                                 | CM                    | Glaser et al., "Familial Hyperinsulinism Caused by an Activating Glucokinase Mutation," The New England Journal of Medicine 338(4):226-230 (1998)   |                |  |
|                                 | CN                    | Grimsby et al., "Allosteric Activators of Glucokinase: Potential Role in Diabetes Therapy," Science 301:370-373 (2003)  |                |  |
|                                 | CO                    | Grimsby, "Glucokinase Activators - Potential Treatment for Type 2 Diabetes," Roche - SMI Diabetes London UK pgs. 28-29 (2002)   |                |  |
|                                 | CP                    | Kurata et al., "Structural Evaluation of Glucose Analogues on Feeding Elicitation in Rat," Metabolism 38(1):46-51 (1989)  |                |  |

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|  |   |    |   | Filing Date              | May 12, 2005       |
|  |   |    |   | First Named Inventor     | Darren McKerrecher |
|  |   |    |   | Art Unit                 | 1615               |
|  |   |    |   | Examiner Name            | Not Yet Assigned   |
| Sheet  | 3 | of | 3 | Attorney Docket Number   | ASZD-P01-897       |

|     |   |  |
|-----|---|--|
| CQ  | Kurata et al., "D-Glucose Suppression of Eating After Intra-Third Ventricle Infusion in Rat," Physiology & Behavior 37:615-620 (1986)   |  |
| CR  | Levin, "Glucosensing Neurons do More Than Just Sense Glucose," International Journal of Obesity 25(5):S68-S72 (2001)  |  |
| CS  | Levin et al., "Differential Effects of Diet and Obesity on High and Low Affinity Sulfonylurea Binding Sites in the Rat Brain," Brain Research 739:293-300 (1996)  |  |
| CT  | Levin et al., "In vivo and In vitro Regulation of [ <sup>3</sup> H] Glyburide Binding to Brain Sulfonylurea Receptors in Obesity-Prone and Resistant Rats by Glucose," Brain Research 776:146-153 (1997)          |  |
| CU  | Levin et al., "Brain Glucose Sensing and body Energy Homeostasis: Role in Obesity and Diabetes," A. J. of Physiology 276:R1223-R1231 (1999)   |  |
| CV  | Levin et al., "Reduced Glucose-Induced Neuronal Activation in the Hypothalamus of Diet-Induced Obese Rats," Brain Research 808:317-319 (1998)   |  |
| CW  | Lynch et al., "Localization of Glucokinase Gene Expression in the Rat Brain," Diabetes 49:693-700 (2000)  |  |
| CX  | McKerrecher et al., "Discovery, Synthesis and Biological Evaluation of Novel Glucokinase Activators," Bioorganic & Medicinal chemistry Letters 15:2103-2106 (2005)  |  |
| CY  | Mobbs et al., "Brain Glucose-Sensing Mechanisms: Ubiquitous Silencing by Aglycemia vs. Hypothalamic Neuroendocrine Responses," Am. J. Physiol. Endocrinol. Metab. 281:E649-E654 (2001)                            |  |
| CZ  | Moore et al., "Acute Fructose Administration Improves Oral Glucose Tolerance in Adults with Type 2 Diabetes," Diabetes Care 24(11):1882-1887 (2001)   |  |
| CA1 | Printz et al., "Mammalian Glucokinase," Annu. Rev. Nutr. 13:463-496 (1993)  |  |
| CB1 | Qian-Cutrone et al., "Glucolipin A and B, Two New Glucokinase Activators Produced by <i>Streptomyces purpurogeniscleroticus</i> and <i>Nocardia vaccinii</i> ," The Journal of Antibiotics 52(3):245-255 (1999)   |  |
| CC1 | Roncero et al., "Functional Glucokinase Isoforms are Expressed in Rat Brain," Journal of Neurochemistry 74(5):1848-1857 (2000)  |  |
| CD1 | Rowe et al., "Potassium Channel Dysfunction in Hypothalamic Glucose-Receptive Neurones of Obese Zucker Rats," Journal of Physiology 497(2):365-377 (1996)   |  |
| CE1 | Schuit et al., "Perspectives in Diabetes - Glucose Sensing in Pancreatic $\beta$ -Cells - A Model for the Study of Other Glucose-Regulated Cells in Gut, Pancreas, and Hypothalamus," Diabetes 50:1-11 (2001)     |  |
| CF1 | Seoane et al., "Glucokinase Overexpression Restores Glucose Utilization and Storage in Cultured Hepatocytes from Male Zucker Diabetic Fatty Rats," The Journal of Biological Chemistry 274(45):31833-31838 (1999) |  |
| CG1 | Shiota et al., "Glucokinase Gene Locus Transgenic Mice are Resistant to the Development of Obesity-Induced Type 2 Diabetes," Diabetes 50:622-629 (2001)   |  |
| CH1 | Spanswick et al., "Insulin Activates ATP-Sensitive K <sup>+</sup> Channels in Hypothalamic Neurons of Lean, but Not Obese Rats," Nature Neuroscience 3(8):757-758 (2000)  |  |
| CI1 | Spanswick et al., "Leptin Inhibits Hypothalamic Neurons by Activation of ATP-Sensitive Potassium Channels," Nature 390:521-525 (1997)   |  |
| CJ1 | Velho et al., "Impaired Hepatic Glycogen Synthesis in Glucokinase-Deficient (MODY-2) Subjects," J. Clin. Invest. 98:1755-1761 (1996)  |  |
| CK1 | Yang et al., "Hypothalamic Glucose Sensor - Similarities to and Differences from Pancreatic $\beta$ -Cell Mechanisms," Diabetes 48:1763-1772 (1999)   |  |
| CL1 | Carroll et al., "Stress, Signalling and Control, Biochemical Society Meeting 679 2-4 July 2003  |  |

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